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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/903,792 | 07/12/2001 | Yasuhiro Nakata | 36856.527 | 1481 |

7590 06/23/2003

KEATING & BENNETT LLP
10400 Eaton Place, Suite 312
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EXAMINER

SAGAR, KRIPA

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

1756

DATE MAILED: 06/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/903,792

Applicant(s)

NAKATA ET AL.

Examiner

Kripa Sagar

Art Unit

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– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 April 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,6,11 and 16 is/are rejected.
- 7) ☒ Claim(s) 2-5,7-10,12-15 and 17-20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 7.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1,6,11,16 are rejected under 35 U.S.C. 103(a) as being unpatentable over admitted prior art (APA) in view of the non-patent publication of Licari et al. and further in view of Jap.Pat.03244181 to Toru.

The teachings of Applicant admitted prior art and Licari have been discussed in the earlier presented office action of 1/23/03.

Admitted prior art does not teach designing conductors with wider cross-sections at the corners. Licari suggests that adhesion strength may be increased by increasing the cross-sectional area of the conductor. It does not explicitly suggest applying the teaching to corners.

Applicant cited reference, Jap.Pat.03244181 to Toru show conductor patterns with wider corners than the straight-line segments. Fig.4 shows the defects at acute corners with nominal design.

The motivation for combining the teachings of Licari and admitted prior art has been discussed in the earlier office action. It may be noted that the cited references teach the art of forming conductor patterns on substrates. One of ordinary skill in the art

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at the time the invention was made would have been motivated to design conductors with greater cross-section at the corners as taught by Toru in forming the conductor patterns of admitted prior art because Licari teaches that the increased area provides greater adhesion for the conductors and Toru teaches that it increases the "wiring efficiency" and reduces process-generated defects.

3. Claims 1,6,11,16 are rejected under 35 U.S.C. 103(a) as being unpatentable over admitted prior art (APA) in view of US Pat.6407345 to Hirose et al.

The teachings of Applicant admitted prior art and Licari's have been discussed in the earlier presented office action of 1/23/03.

Admitted prior art does not teach designing conductors with wider cross-sections at the corners. Licari suggests that adhesion strength may be increased by increasing the cross-sectional area of the conductor. It does not explicitly suggest applying the teaching to corners.

Hirose teaches forming filets at the corners to reduce stresses (fig.9-12 and abstract).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to form filets at the corners of wiring patterns as taught by Hirose while forming the patterns as taught in admitted prior art; because Hirose teaches that such filets reduce stresses and prevent conductor failures (abstract)

Allowable Subject Matter

4. Claims 2-5,7-10,12-15 and 17-20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The instant claims are allowable because the Applicant has optimized the dimensions of the conductor and thereby shows notable improvement in conductor adhesion.

Response to Arguments

5. Applicant's traversal of the rejections under 35 USC 112 has been considered; but they are not persuasive.

The fabrication steps of the conductor pattern must be unambiguous.

The fabrication method may comprise the steps of dispensing the paste in the shape of the conductor pattern and firing it to drive the non-metallic constituents of the paste. No lithographic steps are required.

Alternatively, a blanket film of paste may be coated on the substrate, lithographically patterned and subsequently fired. Applicant has claimed both steps, which are mutually incompatible. Applicant should have specified the method of forming the conductor pattern.

In the interest of furthering the prosecution of this application, it is assumed that a blanket film is formed and patterned.

6. Applicant's arguments with regard to claim rejections under 35USC103 are not convincing.

Applicant has argued that the cited references do not teach a bottom cross-sectional width of the plurality of the corners larger than a bottom cross sectional width of the straight sections of the conductor pattern. It is further contended that Examiner has used hindsight to arrive at the teaching. Applicant has demanded proof of the teaching in prior art.

The rejection is addressed to one of ordinary skill in the art of circuit board fabrication. Licari's handbook indeed teaches that increasing the adhesion area increases the strength (pp.135-137). That stresses in corners are alleviated by increasing the adhesion area would be obvious to one of ordinary skill in the art. That this fact is amenable to instant verification is further proven by the Applicant. Applicant cited reference, Jap.Pat.03244181 to Toru shows a conductor pattern with wider corners than the straight line segments for "improved working efficiency".

In summary, Applicant has shown improved adhesion with an optimized design. Applicant should claim the design values by re-writing the allowable claims in independent form including all the limitations of the base claim and any intervening claims.

Examiner's attempt to contact the attorney to resolve the issues, did not elicit a response.

Conclusion

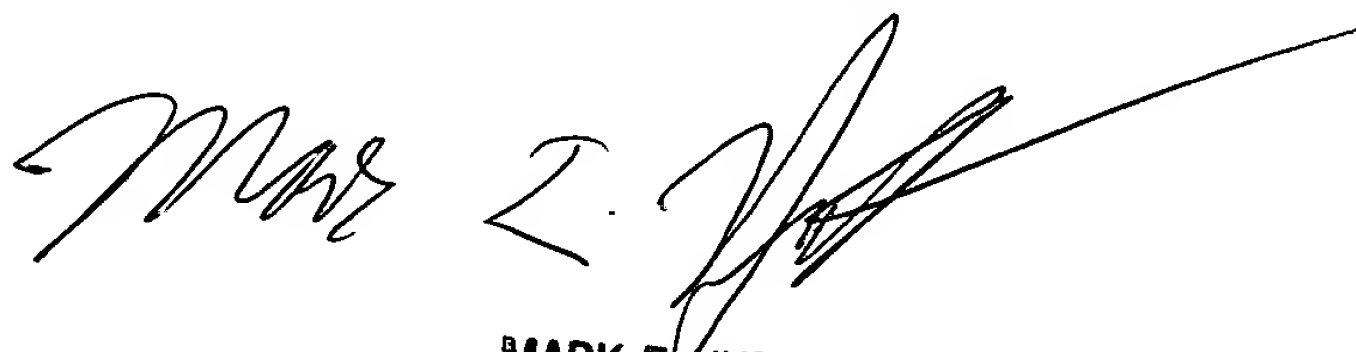
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kripa Sagar whose telephone number is 703-605-4427. The examiner can normally be reached on M-F.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark F Huff can be reached on 703-308-2464. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

MH/ks
June 17, 2003



MARK F. HUFF
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700